

## **PORTABLE SHELTER**

### **FIELD OF THE INVENTION**

The present invention relates generally to shelters for providing protection against airborne contaminants, such as biological, chemical or radioactive agents.

### **BACKGROUND OF THE INVENTION**

The need for protecting against airborne agents such as harmful gases, biological disease agents, or radiant energy, has become a reality since world war I. The threat posed by contamination (chemical, biological and radioactive) threats is a concern of governments and national institutions controlled by the government. While mass protection can be effectively provided in public shelters, individuals or families are prone to the hardships associated with the contamination at home or in the working – place.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

Fig. 1 is a schematic description of a shelter in accordance with an embodiment of the invention.

## DETAILED DESCRIPTION OF THE PRESENT INVENTION

A shelter of the present invention is a portable device capable of being transported and set up quickly. A typical shelter of the invention can be carried by a single person in one or two packaged bundles, each in the form of a carrying case. The shelter of the invention is preferably used in a closed secured environment such as a building. Such a shelter consists of an isolating unit referred to hereinafter as the chamber and an occupant interface to the exterior, typically assuming the form of an interface panel. The chamber consists of a set of joint collapsible, impermeable panels capable of providing isolation to the internal space of the chamber and the occupants therein from airborne contaminants. It also consists of collapsible frame members, typically becoming rigid upon inflating, that provide the structural support for the deployed shelter. The structure of a deployed shelter of the invention is better explained with reference to **Fig. 1** which is a schematic description of a deployed shelter of the invention. Chamber **18** is supported by frame members **20** to which are attached the impermeable panels of which are shown side impermeable panel **22**, and roof impermeable panel **24**. A floor impermeable panel (not shown) seals the chamber from below. Front panel **26** contains a slit **28**, providing access to the chamber and an exit to the exterior of the shelter, respectively. A plurality of entrance slits may be provided in the construction. Entrances are sealable once they are closed, keeping the internal side isolated from the outside. In at least one of the panels one or more window sheets **30** may be installed. The windows permit visual contact of the occupants with the exterior of the chamber. To interface panel **32** are connected a telephone cable **34**, and an electricity supply cable **36**. A control interface is typically integrated with the interface panel, and

is used for implementing occupant control over such sustenance elements as air circulation, air filtration, air pressure, temperature and communications. The positioning of the interface panel within the general architectural features of the shelter is not limited to any particular location in the chamber, as long as its usage and the unfolding and deployment procedures thereof are not impaired.

### **Packaging and deployment**

In accordance with the present invention, the entire shelter is typically packaged in one or two bundles, to be carried by a single person. In a preferred embodiment of the invention a carriage case contains the entire shelter so that the outer shell of the case constitutes the interface panel. When the shelter is unfolded, the inside is spread out to form the chamber that becomes erect when the frame members are inflated. The shell remains attached to one of the panels of the chamber or to the frame, or to both. The frame members are inflated to the extent that the erected construction stands firmly. Inflating the frame members can be achieved in one of several ways, for example, by a hand or foot pump is connected through a valve to the frame members. When actuated, the pump compresses air into one of the frame members and the air pressure is passed on to all the other frame members through airtight channels.

In order to facilitate access into and out of the shelter, an entrance slit is provided in one or more of the side or front panels. Typically, a zipper seals of the opening, and a further seal is provided by from the exterior such as by a sticky flap of the panel at the side of the slit.

### **The Interface Panel and the control interface**

The interface panel contains the connections to the exterior of the chamber. Additionally, the interface panel contains, typically, the control interface. As a matter of convenience, the interface panel is installed within or on the rigid shell of the carrying case, thus providing a mechanically stable setting for handling and actuating switches and or plugs. In a preferred embodiment of the invention, two control interfaces are installed in the shelter. An internally installed control interface allows the occupants of the shelter to manage the sustenance elements listed above. An externally installed control interface, permits the occupants to manage the same elements, typically, from the outside of the shelter. This can be used, for example, if warning is provided, leaving sufficient time before entering the chamber becomes necessary.

The clear window sheets allow the occupants to see through the panels, while being protected at the inside. In a typical home set – up, the occupants may use these windows to watch television through the window sheets. This may become very useful if a television does not fit in the chamber.

### **Applications of the present invention**

The shelter of the invention is most conveniently used in homes, offices and other enclosed buildings. The use of such a shelter enables the occupants to protect themselves against from airborne contamination threats yet facilitates a continuous connection with the external world. The electrical connection facilitates the use of electrical appliances inside the chamber, such as ventilators, air purifiers, heaters, lighting and entertainment facilities. The air pressure inside the chamber of the invention builds up to a value slightly above

the atmospheric pressure and any incoming air must be prefiltered by a filter, typically located in the interface panel. A backup battery can be provided in the chamber for extending the functionality of at least some of the electrical appliances in case of a power failure. Such a battery is preferably installed in the interface panel. In this respect, a low power emergency lighting, may be installed in the chamber to facilitate long term lighting in case of power failure. Communications via a telephone, as well as other communications connections is effected through the interface panel allowing voice and internet communications with the outside world. The occupants of the chamber can move about with some measure of comfort the internal space, they can sit, stand or rest lying down, as well as eat and drink in the chamber. Some measure of association with other occupants is possible as well. Family pets can also find refuge and protection inside the shelter of the invention.

The clear window sheets at the side panels allow the occupants to remain in visual contact with the exterior while staying in the protected chamber. An additional effect of the windows is that of providing a more relaxed environment for small children who may be less than patient to stay inside for the required period of time. Gazing through the window can provide a more comfortable environment, and permit occupants to keep a watch over outside events.